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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/706,320	11/12/2003	Craig S. Gittleman	GP-303297	6448

7590 11/29/2005

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General Motors Corporation  
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Detroit, MI 48265-3000

EXAMINER
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SPITZER, ROBERT H

ART UNIT	PAPER NUMBER
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1724

DATE MAILED: 11/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/706,320

Applicant(s)

GITTLEMAN ET AL.

Examiner

Robert H. Spitzer

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 14 November 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-71 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-71 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 1-8,11,13-33,36,38-54,56 and 58-71 are again rejected under 35 U.S.C. 102(b) as being clearly anticipated by the disclosure of Fuderer et al. (3,986,849), who show a PSA process and apparatus that utilize the same process steps as are recited in these claims.

3. Claims 9 and 34 are again rejected under 35 U.S.C. 103(a) as being unpatentable over Fuderer et al. (3,986,849) in view of Lemcoff et al. (5,820,656). The claims differ from the disclosure of Fuderer et al. ('849) in the valves being rotary valves at both the feed and product ends of the adsorber vessels. Lemcoff et al. ('656) show the use of a separate rotary valve at both the feed end and the product end of adsorber vessels as an alternative to the use of multiple fixed valves. It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to substitute a separate rotary valve for both the feed and product valves of the adsorber vessels of Fuderer et al. ('849), in view of such showing by Lemcoff et al. ('656).

4. Claims 10,35 and 55 are again rejected under 35 U.S.C. 103(a) as being unpatentable over Fuderer et al. (3,986,849) in view of Lemcoff et al. (5,807,423). The claims differ from the disclosure of Fuderer et al. ('849) in the valves for the feed and product gases being a single rotary valve. Lemcoff et al. ('423) show the use of a single rotary valve for both the feed and product streams from multiple adsorber vessels, as an alternative to the use of fixed valves. It would have been obvious to one of ordinary skill

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in the art, at the time the invention was made, to substitute a single rotary valve for both the feed end and product end valves of the adsorber vessels of Fuderer et al. ('849) as an alternative to the use of multiple fixed valves, in view of such showing by Lemcoff et al. ('423).

5. Claims 12,37 and 57 are again rejected under 35 U.S.C. 103(a) as being unpatentable over Fuderer et al. (3,986,849) in view of either Towler et al. (6,299,994) or Gittleman et al. (2002/0110504). The claims differ from the disclosure of Fuderer et al. ('849) in the product hydrogen gas being sent directly into a fuel cell. Both Towler et al. ('994) and Gittleman et al. (2002/0110504) show that purified hydrogen product gas can be fed directly into a fuel cell. It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to direct the purified hydrogen product gas from the PSA process and apparatus of Fuderer et al. ('849) directly into a fuel cell, in view of the showing of either Towler et al. ('994) or Gittleman et al. (2002/0110504), when such fuel cell needs such purified hydrogen gas.

6. Applicant's arguments filed November 14, 2005 have been fully considered but they are not persuasive. With respect to the Fuderer et al. ('849) reference, applicants' state that the PSA process disclosed therein has a blow down step which "occurs after the product pressurization (PP) step", and thus cannot directly follow an equalization down stage. Applicants are mistaken, because the letters "PP" refer to a "cocurrent depressurization providing purge gas (PP)" step, as explained at col. 8, lines 20-36, of Fuderer et al. ('849), wherein the sequential steps for the PSA cycle are disclosed. Thus, in Fuderer et al. ('849), the blow down step does indeed directly follow a step

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which reduces pressure (depressurization) within an adsorber bed. The same applies to the product pressurization step, which occurs after multiple pressurization up steps identified as steps "(E3R)", "(E2R)" and "(E1R)", which are then directly followed by "final repressurization to the feed gas pressure by product gas introduction at the product discharge end (FR)". See the same col. 8, lines 20-36 of Fuderer et al. ('849). As noted above, the step labeled as "(PP)" in Fuderer et al. ('849) is not a product pressurization stage, but is the provide purge depressurization step. Still further, the step labeled as "(FR)" is not a repressurization step using feed gas, as argued by applicants, but is instead, the final repressurization step which uses "product gas", which is the non-adsorbed hydrogen gas. Thus, the PSA process and apparatus disclosed by Fuderer et al. ('849) are indeed the same as are recited in these claims. As for the pressure at which adsorption occurs being below 10 bar and the product hydrogen gas being used for a fuel cell operation, see the secondary references to Towler et al. (6,299,994) and Gitleman et al. (2002/0110504). For the claims which require that the valves to be rotary valves, see the above referred to two Lemcoff et al. references. Any other remarks made by applicants and not specifically commented upon by the examiner, have been considered.

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

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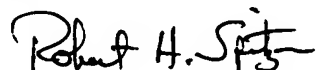
mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert H. Spitzer whose telephone number is (571) 272-1167. The examiner can normally be reached on Monday-Thursday from (5:30AM-4:00PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on (571) 272-1166. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

November 28, 2005

  
Robert H. Spitzer  
Primary Examiner  
Art Unit 1724

November 28, 2005